

began on the 4th, mitigating the severity of the past dry spell. Ashwood, 31st, unusually severe drought throughout the middle portion of the state; not sufficient rain to lay the dust for the past 64 days; from the 10th to 13th, inclusive, the heat was so oppressive that it seemed as if the air came in blasts from a furnace. Clarksville, 31st, no rain has fallen during the month; injury to crops "immense;" grass "entirely burned up;" wells and cisterns dry; water for stock has become very scarce, and only large streams are running. *Texas*.—Ft. McKavett, 19th, this section of country has suffered from long continued drought during most of the summer months; very little rain has fallen for the past 4 weeks; stock men complain about the scarcity of grass, even in lowland pastures. Denison, 31st, drought in this section is unprecedented; fruit and forest trees dying in great numbers; the earth in many places is cracked sufficiently to admit small animals; cattle famishing for want of water, and stock men report great loss in the herds; fruit and corn almost a total failure; cotton, half a crop. Brackettville, 20th, great suffering from want of rain; cattle dying; 31st, sheep men state that unless rain soon falls, their losses will be very heavy. *Virginia*.—In the south and southwestern portions of the state there have been but two or three light rains since the latter part of May; corn and grass crops a complete failure; in the southwest portion, the grass has been entirely destroyed, and grazers compelled to cut off the branches of trees to be used as forage for stock; there has been no such season since the great drought of 1806. Richmond, 31st, a very severe drought still continues throughout this portion of the state; streams are drying up, and manufacturers and farmers are greatly inconvenienced; James river lower than for the past 50 years; tobacco and fall crops an entire failure; the dust is fearful. Snowville, 31st, driest month ever known in this locality; river lower than ever before known; crops and stock suffering for water. Norfolk, 31st, all kinds of vegetation drying up; river very low; never before within the memory of the oldest inhabitants has Virginia experienced such a drought. Lynchburg, 31st, the long continued and unprecedented drought has irreparably injured crops; in the southwestern portion of the state, where grazing is chiefly carried on, the corn crop has been cut for use as fodder; except on bottom lands the corn and tobacco crops are totally lost. *West Virginia*.—Flemington, 31st, driest month ever known; corn crop badly damaged; pastures drying up. Helvetia, 31st, no rain has fallen since the 13th; monthly rainfall smallest (with one exception) in the past five years; river lower than ever known before. Morgantown, river exceedingly low; vegetation suffering severely. 21st, corn crop almost a total failure. 26th, vegetation dying; water in river lower than for many years. 29th, river bed under suspension bridge nearly dry.

WINDS.

The prevailing winds during the month of August, 1881, at Signal Service stations, are shown on chart No. II, by arrows, which fly with the wind. In the Middle Atlantic states and New England, *southeast to southwest*; South Atlantic states, *northeasterly*; West Gulf states, and Texas, *east and southeast*; Lower Lake region, *northerly*; Upper Mississippi and Lower Missouri valleys, *southerly*; Northern Plateau and Northern Pacific coast regions, *northwesterly*; Southern Plateau and Southern Pacific coast regions, *southerly*; elsewhere, *variable*.

Total Movements of the Air.—The following are the largest total movements at Signal Service stations: Mt. Washington, 18,908 miles; North Platte, 11,795; Portsmouth, N. C., 11,330; Hatteras, 10,681; Moorehead, Minn., 9,646; Kittyhawk, 9,618; San Francisco, 9,409; Port Eads, La., 9,084; Huron, Dak., 8,856; Chincoteague, Va., 8,476; Fort Keogh, Mont., 8,381; New Shoreham, R. I., 8,278; Delaware Breakwater, 8,233; Ft. Buford, Dak., 8,217; Macon, N. C., 8,150; Eagle Rock, Idaho, 8,123; Dodge City, 8,039. The *smallest* are: La Mesilla, N. M., 902; Silver City, N. M., 1,306; Phoenix, Ariz., 1,377; Florence, Ariz., 1,729; Lynchburg, 1,793; Memphis, 1,910; Uvalde, Tex., 2,051; Morgantown, 2,236; Fredericksburg, Tex., 2,316; Roseburg, Or., 2,435; Washington, 2,543; El Paso, Tex., 2,568; Olympia, 2,624; Lewiston, Idaho, 2,671; Red Bluff, Cal., 2,679; Springfield, Mass., 2,826; Visalia, Cal., 2,828; Pittsburgh, 2,917.

High Winds.—Winds of 50 miles per hour and over were reported as follows: On summit of Mt. Washington, 5th, 6th, 7th, 9th to 14th, 31st; maximum velocity 90 miles, NW., 31st. Savannah, 80, N., 27th. Indianola, 56, N., 6th. Charleston, 54, NE., 27th. Bismarck, 50, W., 3d. Delaware Breakwater, 50, SW., 13th. Smithville, N. C., 50, E., 27th.

Local Storms.—Minneapolis, Minn., 5th, a violent northwest storm passed over the central portion of the state, moving thence over western Wisconsin, committing damage in parts of Washington, Peirce and Dunn counties. Many buildings were blown down or unroofed, hay and grain stacks scattered for miles along the course of the storm, fences demolished and telegraph wires broken. Coney Island, N. Y., 26th, very violent

wind storm, sweeping a heavy sea over the marine promenade, causing a tremendous surf, and badly damaging two vessels. Spencer, Ia., 5th, about 4 p. m. dark heavy clouds gathered rapidly in the northwest and southwest, and moved eastward toward a common point. Upon meeting, the clouds could be seen rolling over each other and tumbling about in a fearful manner, followed soon after by the formation of a long, narrow cloud like a water-spout. Twenty buildings were blown down and two persons killed. Fields of corn in the path of the storm were left as flat as if rolled. All crops were beaten into the ground; width of storm's path from a half to three-fourths of mile; length about 25 miles. Cleveland, Ohio, 12th, about 8 p. m., violent wind storm visited the east side of the city; roof of the Union Freight Depot torn off, a heavy timber 20 feet long and 9 inches square was carried 60 feet; three pinnacles from St. Paul's Church blown down; fences, shade trees, awnings and chimneys were quite generally damaged, and in many cases completely demolished; lumber piles were scattered in every direction; the lake as far as the eye could reach was lashed into a foaming mass, causing considerable damage to vessels; sailors along the docks stated that the squall was the most violent for many years. Petersburg, Va., 13th, about 5 p. m., heaviest wind storm for years; rain fell in torrents, and the wind reached an estimated velocity of over 60 miles per hour; many buildings were unroofed and others demolished; trees, fences, signs, awnings and chimneys were destroyed in various parts of the city; beyond the city the loss to farmers from damage to their crops and orchards was very great. Franklin, N. C., 13th, very violent southwest storm; path of destruction from 1 to 1½ miles wide. Chambersburg, Pa., 13th, 1.50 p. m., violent southwest storm; several houses and one church demolished; many buildings were unroofed; trees and fences were blown down throughout the course of the storm. Milton, Pa., 6th, violent southwest storm; several buildings and also fences and trees blown down; path of destruction narrow. Fort Barrancas, Fla., 3d, violent gale with heavy and continuous rain; trees uprooted, buildings unroofed, and two vessels driven upon the beach and completely wrecked.

RELATIVE HUMIDITY.

The percentage of mean relative humidity for the month ranges as follows: New England, 74 to 90; Middle Atlantic states, 54 to 84; South Atlantic states, 56 to 82; Eastern Gulf states, 66 to 78; Western Gulf states, 50 to 80; Ohio Valley and Tennessee, 52 to 69; Lower Lake region, 62 to 71; Upper Lake region, 64 to 79; extreme Northwest, 60 to 66; Upper Mississippi valley, 53 to 80; Lower Missouri valley, 56 to 79; Northern Slope, 35 to 57; Middle Slope, 55 to 76; Southern Slope, 48 to 67; Rio Grande valley, 54 to 64; Southern Plateau, 55 to 71; Middle Plateau, 24 to 37; Northern Plateau, 32 to 62; North Pacific coast region, 63 to 77; Middle Pacific coast region, 35 to 79; South Pacific coast region, 50 to 73.

VERIFICATIONS.

Indications.—The detailed comparison of the tri-daily indications for August, with the telegraphic reports for the succeeding twenty-four hours, shows the general percentage of verifications to be 88.8 per cent. The percentage for the four elements are: Weather, 88.4; wind 85.4; temperature, 91.4; barometer, 90.1 per cent. By geographical districts they are: For New England, 89.7; Middle Atlantic states, 90.3; South Atlantic states, 91.3; Eastern Gulf states, 91.7; Western Gulf states, 95.1; Lower Lake region, 92.7; Upper Lake region, 87.0; Tennessee and Ohio Valley, 88.7; Upper Mississippi Valley, 80.7; Lower Missouri Valley, 80.1; Northern Pacific coast region, 67.9; Central Pacific coast region, 100.0; Southern Pacific coast region, 100.0. There were 92 omissions to predict (49 being due to the absence of reports from the Pacific coast) out of 3,813, or 2.4 per cent. Of the 3,721 predictions that have been made, 100, or 2.68 per cent., are considered to have entirely failed; 71, or 1.91 per cent., were one-fourth verified; 414, or 11.13 per cent., were one-half verified; 229, or 6.15 per cent., were three-fourths verified; 2,907, or 78.13 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

Cautionary Signals: Sixty cautionary signals were displayed during the month, of which 45, or 75.0 per cent., were fully justified by winds of 25 miles per hour or over, at or within a radius of 100 miles of the station. No off-shore signals were displayed. The above does not include signals ordered at display stations where the velocity is only estimated. Seventy-six winds of twenty-five miles, or over, were reported, for which no signals were ordered. Fourteen signals were ordered late.